



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,163	03/31/2004	Zhenlin Liu	A8698	4479
23373 7590 08/06/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
SAYADIAN, HIRAYR				
ART UNIT		PAPER NUMBER		
2814				
MAIL DATE		DELIVERY MODE		
08/06/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/813,163

**Applicant(s)**

LIU ET AL.

**Examiner**

HRAYR A. SAYADIAN

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 1, 3, 5, 6, 10, 11 and 15-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2, 4, 7-9 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 41 and 42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date 2/12/2009 & 3/5/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: \_\_\_\_\_

**DETAILED 08/08/08 OFFICE ACTION**

**The Election and Restriction Requirements and Applicant's Elections**

1. Claims 1, 3, 5, 6, 10, 11, 15-40, have been withdrawn as being directed to species, or directed to inventions, non-elected without traverse.

The restriction requirements are proper and their finality is maintained.

**35 U.S.C. § 103 Rejections of the Claims**

2. The following is a quotation of 35 U.S.C. § 103(a), the basis for the obviousness rejections in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section § 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 4, 7-9, and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. PGPUB 2003/0156605 to "Richardson." U.S. Pat. Nos. 6,067,187 and 5,701,195 to "Onaka" and "Chikama," respectively, are provided as evidence.

As to claim interpretation: recitations connoting optional elements/functions, including, but not limited to, "selected" and "selectively," are considered and determined to have a scope of choosing not to include/select the optional element/function, which includes the scope of not.

Absent claiming how functional effects, or affects, are achieved by structural limitations, a functional recitation is determined to be intended-use language (or intended-outcome) not distinguishing scope of an apparatus claim over prior art apparatus capable of performing the intended-use (or capable of achieving the intended-outcome) language. See, for example, M.P.E.P § 2114 and the precedents cited therein. And, absent claiming a required step or

structure or feature further limiting scope of a method or process claim, reciting an intended-use (or intended-outcome or an outcome of a required step already disclosed by the prior art or an optional step or structure or feature) in the claim fails to distinguish the claim over prior art that can be so modified or used. See, for example, M.P.E.P. § 2111.04, and precedents cited therein.

With respect to claim 2, for example, "a stretcher module for ..." has been considered and determined to have a scope of "a stretcher module" with the intent to use it "for ...." And with respect to claim 4, for example, the recitation "an AOM selecting output ..." has been considered and determined to have a scope of an AOM, with the intended function of "selecting ...." And in claim 4, "is provided as a pre-tested module" and "said system is constructed by individually connecting ..." are intended use/method of making language, not narrowing scope of the structural element. "Pre-tested" is considered and determined to have a scope including choosing the element, which is inherently met by element forming part of the system. Contrary to the explanation in the 2/12/2009 Reply, "pre-tested" does not describe a property or a state of being of a module affecting the structure of the module because pre-testing does not affect any structural characteristic of the module. Rather, a pre-tested module has a scope limiting only to a module that has somehow been pre-tested before a potential further use, including selecting the module for the potential use. Indeed the claims fail to recite any specific pre-testing of any specific characteristic of a module before a potential use.

As to art rejection: Richardson, the front page, discloses an oscillator 10, a pulse selector 52, stretcher 128, the fiber amplifier cascade including first pre-amplifier 68a, second pre-amplifier 68b, power amplifier 96, and pulse compressor 146. See paragraph [0101] of the PGPU corresponding to this application, describing FIG. 1. Richardson also discloses AOMs in at least 52 and 142a,b.

Additionally, with respect to claim 2, a pulse laser system composed of a plurality of replaceable (intended use language because neither the preamble nor the body of the claim identifies which of the modules are replaceable and the modules recited in the body of the claims do not require "replaceable" to have a defined scope; additionally, the claims recite the transitional phrase "comprising" and therefore have a scope reading on any non-recited, as well as the recited elements, being replaceable, which scope clearly reads on the system Richardson

discloses because the elements of the Richardson system are replaceable, including, but not limited to, the lens 30 and quarter waveplate 32 and halfwave plate 34, which figure 2 shows to be separately arranged and therefore replaceable), comprising: an ultrafast oscillator module (the laser source in 10); a stretcher module 128 for temporally stretching the output of said oscillator module; a spectral filter module (the first pre-amplifier 68a) placed before or after said stretcher module 128, said spectral filter module optically connected to said ultrafast oscillator module and comprising at least one spectral filter having a wavelength sensitive characteristic that modifies a spectral shape of an output from said ultrafast oscillator, including a spectral width of said output; at least one pre-amplifier module (second pre-amplifier 68b) downstream of said spectral filter module; a down-counter module 52 for reducing the repetition rate of the laser system; a power amplifier module 96 for amplifying the output of the down-counter module; and a compressor 146 for temporally shortening the output of said power amplifier module.

Amplifiers "hav[e] a wavelength sensitive characteristic that modifies a spectral shape of an [input to the amplifiers], including spectral width of [the input]." See, for example, paragraph [0066] of the PGPUB of this application describing "[using] the preamplifier ... as a spectral filter." See the last sentence of the second paragraph in section B, "Claim Amendments," on page 15 of the 2/12/2009 Reply recognizing that amplifiers have filtering action. And, in Richardson, compare any of FIGs. 16, 24, 30, and 31, with FIG. 9.

It would be obvious for one of ordinary skill in the art to realize that the first pre-amplifier 68a "ha[s] a wavelength sensitive characteristic that modifies a spectral shape of an output from said ultrafast oscillator, including spectral width of said output" as recited in claim 2.

Specifically, Richardson discloses the spectral shape of the oscillator system 10 in FIGs. 8 and 9. Richardson discloses the spectral shape of the used output of the oscillator system 10 to be that of FIG. 9 and having a FWHM of 18.6 nm. See paragraph [0130].

Richardson discloses only two elements (the pulse selector 52 and the stretcher 128) between the oscillator system 10 and the first pre-amplifier 68a, neither of which modifies the spectral shape of the output of the oscillator system 10. The pulse selector 52 selects the pulse(s) that go through, and stretcher 128 "acts in the conventional manner to increase the duration of

the pulses [due to dispersion] while maintaining their energy, consequently reducing the pulse peak power." See paragraph [0192] of Richardson.

Specifically, Richardson discloses the first pre-amplifier 68a to be used in the small signal regime. See, for example, Table 1 on page 8 of Richardson; and see paragraphs [0151]-[0152] of Richardson. Richardson discloses the spectral shape of the ASE output of the first pre-amplifier 68a to be that shown in FIG. 16.

And as is well known in the laser art that in small signal regime the ASE spectrum reflects the small signal gain spectrum. See, for example, U.S. Pat. No. 6,067,187 to "Onaka," column 4, lines 54-58; and see Chikama, column 5, lines 35-52.

Comparing FIG. 16 with FIG. 9 in Richardson shows that pre-amplifier 68a, as recognized by this application and the Reply, "modifies a spectral shape of an output from said ultrafast oscillator, including spectral width of said output." Specifically, the shape of the wavelength spectrum shown in FIG. 16 is clearly modified with respect to that shown in FIG. 9, and the FWHM (measured at the -3dB points of FIG. 16) is 17.0-17.6 nm in FIG. 16 (first pre-amplifier 68a) compared with FWHM of 18.6 nm in FIG. 9 (oscillator system 10). The calculations show that the FWHM (-3 dB points) in FIG. 16 is 14-14.5 nm, whereas the 20 nm division in FIG. 16 is 16.5 nm.

At the time of the invention of this application therefore one of ordinary skill in the art would have considered the claimed spectral filter module to be obvious over the first pre-amplifier Richardson discloses.

With respect to claim 4, Richardson discloses a pulse laser amplification system comprising: a signal source; a stretcher temporally stretching an output of said source; a fiber amplifier; and a compressor recompressing an output of said amplifier; and an AOM selecting output pulses from said amplifier; wherein each of said components comprise a pre-tested module, and said system is configured with at least said signal source, said stretcher, said fiber amplifier and said AOM optically connected via simple fiber splices (the source, the stretcher, the fiber amplifier, and the AOM are optically connected via simple fiber splices shown, for

example, as the fibers between the xs in FIG. 27); at least one tap unit within or between ones of said modules, including means for picking off a portion of said signal for enabling measurement of a spectrum within or between said modules (the means for picking off a portion of signal at least reads on the polished ends of the fibers, polished for low loss, which indicates the presence of loss via reflection, albeit low, see, for example, paragraph [0141], which reflected signal enables measuring of a spectrum within or between the modules) and at least one spectral filter, said at least one spectral filter being disposed external to said signal source and said fiber amplifier, and either before or after said stretcher, said filter having a wavelength sensitive characteristic that modifies a spectral shape of an output from said signal source and narrows the spectrum of the signal source output (see, claim 2, discussion of the claimed filter module being obvious over the Richardson disclosed first pre-amplifier 68a); wherein at least one of said tap units (for example, 76a) is located downstream of said filter and "configured to enable measurement" of said narrowed spectrum (see, for example, FIG. 16 showing the narrowed spectrum after the first pre-amplifier 68a).

The very nature of the taps disclosed and recited in the claims of this application (see, for example, paragraph [0057] of the PGPUB of this application) makes clear that Applicant intends the taps and their equivalents to read on end surfaces of fibers and the reflections off of these end surfaces. The end surfaces of the fibers disclosed in Richardson therefore are within the scope of taps disclosed by this application and the scope of taps recited in the claims.

With respect to claim 7, Richardson discloses tap modules (any of the surfaces 76a, 76b, or others like them surrounding amplifier 98; see, for example, FIG. 27). It is noted that this application describes tap module as giving a tap point, which is accomplished by reflecting a fraction of light off the surface; see, for example, paragraph [0057] of the PGPUB of this application.

With respect to claim 8, Richardson discloses polarization modules (136 and 138) between selected ones of said modules.

With respect to claim 9, Richardson discloses the down-counter comprising an AOM. See, for example, paragraph [0135]. The further recitation "serves as a bandwidth filter" is

an intended use, functional language, and absent claiming how functional effects, or affects, are achieved by structural limitations, a functional recitation fails to distinguish scope of an apparatus claim over a prior art apparatus capable of performing the intended-use (or capable of achieving the intended-outcome) language. See, for example, M.P.E.P § 2114 and the precedents cited therein. The AOM Richardson discloses is capable of serving as bandwidth filter (at least because of the bandwidth of the periodicity of the AOM resulting in the modulation function) and therefor anticipates the additional recitation in claim 9.

With respect to claim 12, Richardson discloses a diode based pump. See, for example, claim 21. The further recitation "serves as a spectral filter" is an intended use, functional language, and absent claiming how functional effects, or affects, are achieved by structural limitations, a functional recitation fails to distinguish scope of an apparatus claim over a prior art apparatus capable of performing the intended-use (or capable of achieving the intended-outcome) language. See, for example, M.P.E.P § 2114 and the precedents cited therein. The diode-pump Richardson discloses is capable of serving as spectral filter (at least because of the bandwidth of the pump radiation providing the amplifying gain) and therefor anticipates the additional recitation in claim 12.

With respect to claim 13, the oscillator Richardson discloses produces a broad spectrum above approximately 10 nm. See the spectrum shown in FIG. 9. The additional recitation in claim 13 does not limit scope of the claim because it is not recited as the claim comprising "...," rather it is recited as the device of the claim being used with. The oscillator/amplifier system Richardson discloses can be used with an attenuator, and in the manner recited, and this application is the evidence for the truth of this assertion.

With respect to claim 14, the pulse output from the compressor in Richardson is in the fs regime. See, for example, FIG. 32.

**Claim(s) objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form**



4. New Claims 41 and 42 are objected to as being dependent upon rejected base claim 4, but would be allowable if rewritten in independent form including all of the limitations of the base claim.

Claim 41 is allowable because the prior art of record fails to disclose "attenuator module disposed between said signal source and said stretcher, said attenuator controlling an amplitude of pulses emitted from said source so as to ...," recited in the context of claim 41.

The prior art discloses and motivates using filtering attenuators between an oscillator and amplifier (see, for example, PGPUB US 2002/0105995 for a U.S. Pat. Application by "Govorkov," paragraph [0123], U.S. Pat. No. 6,373,867 to "Lin," column 5, line 66 to column 6, line 24, and U.S. Pat. No. 6,529,672 to "Blondel," column 4, lines 52-63). The prior art references of record however fail to disclose placing the filtering attenuators in between the oscillator and the stretcher.

#### **Response to Applicant's Argument(s)**

5. The arguments in the 2/12/2009 "reply" have been fully considered, but are found not to overcome the prior art rejections.

The Reply contends that Richardson fails to disclose a spectral filter module. In response, the rejection above explains how the first pre-amplifier 68a in Richardson makes obvious the language in the claims contended to distinguish over the prior art.

#### **CONCLUSION**

6. **THIS OFFICE ACTION IS MADE FINAL.**

A shortened statutory period for reply to this Office Action is set to expire THREE MONTHS from the mailing date of this Office Action. Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

If a first reply is filed within TWO MONTHS of the mailing date of this Office Action and the advisory Office Action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the

advisory Office Action is mailed, and any extension fee pursuant to 37 CFR § 1.136(a) will be calculated from the mailing date of the advisory Office Action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this Office Action.

Any inquiry concerning this communication or earlier communications from an Examiner should be directed to Examiner Hrayr A. Sayadian, at (571) 272-7779, on Monday through Friday, 7:30 am – 4:00 pm ET.

If attempts to reach Mr. Sayadian by telephone are unsuccessful, his supervisor, Supervisory Primary Examiner Kenneth Parker, can be reached at (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available only through Private PAIR. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. The Electronic Business Center (EBC) at 866-217-9197 (toll-free) may answer questions on how to access the Private PAIR system.

/HAS/

/Wael M Fahmy/

Supervisory Patent Examiner, Art Unit 2814